

Remarks

Reconsideration of the present application, as amended, is respectfully requested.

Claims 1-11, 21-28, 37, 39 and 40 are pending in this application.

The present invention relates to a flexible reconfigurable optical add-drop multiplexer (OADM) architecture. Independent claims 1, 21 and 39 each recite, in part, an optical combination structure that combines a set of N/P wavelengths into a single combined optical signal while maintaining a linear orthogonal polarization state for pairs of said wavelengths and while adding optical noise incoherently to minimize optical noise. In addition to the optical combination structure, the claimed invention includes a first optical device where P input ports single combined output signal at an input at each of said P input ports into a single output signal where each of said P input ports accepts non-overlapping interleaved sets of N/P wavelengths; and an optical coupler that combines said signal output signal with said WDM signal This novel combination is not disclosed or suggested by the cited art.

DISCUSSION RELATING TO THE REJECTION UNDER 35 USC 103(a)

Claims 1-2, 5-6, 21-22, 25-28 and 37 stand rejected under 35 USC §103(a) as being anticipated by US Patent No. 6,751,372, issued June 15, 2004 to Feuer et al. (Feuer) in view of US Patent No. 6,785,474 to Hirt et al. (Hirt). Applicant respectfully traverses this rejection.

Feuer discloses a configurable four-port wavelength-selective optical crossbar switch. According to the Examiner, Feuer describes an apparatus that has a first optical device comprising a cyclic AWG 303 with P input ports. The Examiner contends that AWG 303 functions to combine P input ports into a single output signal. Further, according to the Examiner, Feuer describes a second optical device 204 that combines the signal output with the WDM signal.

To be construed as anticipatory, the prior art must teach or at least suggest all claim limitations. In contrast to the elements of the presently claimed invention, Feuer neither teaches nor suggests an optical combination structure that combines a set of N/P wavelengths into a single combined optical signal while maintaining a linear orthogonal polarization state for pairs

of said wavelengths. Further, Feuer neither teaches nor suggests an optical combination structure that adds optical noise incoherently to minimize optical noise. Without these additional elements, Feuer cannot function and does not provide the remarkable advantages achieved by the presently claimed invention.

Combining Feuer with Hirt does not render the present invention obvious to one of ordinary skill in the art. Hirt teaches a technique for reducing the relative intensity noise (RIN) in a communication system such as a cable television system. In the embodiment cited by the Examiner to support the rejection, Hirt uses an RF splitter (or a redundancy circuit) to split an RF signal into two equal amplitude signals that are then applied to two parallel optical transmitters 510 and 515. Each optical transmitter modulates the respective RF signal and then transmits an optical signal modulated to follow the input RF signal to the input of an amplifier. (see column 5 lines 1- 10). The amplified optical signals are combined to enable the composite amplified optical signal to travel further through the communication medium. (See column 6 at the sentence beginning on line 30). Applicants submit that combining prior art references is not proper because the cited language in the Hirt reference relates to an RF system does not align with the claimed invention in principle of operation.

However, it is noted that with respect to the description related to Figure 2, Hirt also describes an optical system where a reduced relative intensity noise or RIN is achieved by reducing the power in two independent and uncorrelated signals with optical attenuator. Clearly, attenuating the power in the signal also reduces the amount of RIN in the signal. These two signals from independent sources are then combined to form a composite output signal that has an output power value equal to the sum of the power value of the two beams. (See, for example, the Abstract and column 3, line 61 – column 4, line 36).

When the Feuer and Hirt references are each considered as a whole, it is clear that combining the references would not achieve the claimed invention. Specifically, there is no suggestion in the art as to how or where to apply the RIN attenuation technique to the Feuer apparatus to achieve the benefits provided by the present invention. At best, the combination of Feuer and Hirt merely reiterate a well known feature of a cyclic AWG – the wavelength selective cyclic AWG provides highly beneficial noise filtering effect by rejecting wavelengths other than the accepted wavelengths as set forth in the present specification at page 9, lines 8-12. When

examined in context, it is clear that the claim limitations of the present invention are not met by these two references either alone or in combination.

Further, there no suggestion or motivation, in either reference or in the knowledge generally available to one of ordinary skill in the art, to modify the Feuer reference or to combine reference teachings in the manner suggested by the Examiner. Moreover, if the references are combined, there is no reasonable expectation of success. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. To combine references without evidentiary support by the prior art constitutes impermissible hindsight.

Since dependent claims 2, 5-6, 22, 25-28 add limitations to allowable base claim, each such claim is not anticipated by Feuer. Each dependent claim is also believed to be in allowable condition.

Claim 37, as amended, is allowable for the above noted reasons.

Claims 1, 3-11, 21, 23-27, 37 and 39-40 stand rejected under 35 USC §103(a) as being unpatentable over U.S. Patent Application Publication No. 2003/0223682 to Kinoshita et al. (Kinoshita) in view of U.S. Patent Application Publication No. 2003/0223682 to Kikuchi et al. (Kikuchi) and Hirt. Applicant respectfully traverses this rejection.

According to the Examiner, it would have been obvious to combine the device of Kikuchi in the apparatus of Kinoshita to reduce the bandwidth necessary for the added signal. The Examiner relies on page 2 of the Kikuchi reference to support the contention that it would be obvious to make the combined apparatus. However, it is well settled that in order to support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985).

Page 2 of the Kikuchi reference refers to the use of narrow band-pass filters to implement a vestigial-side-band technique to reduce bandwidth of a central portion of a light signal and abandon any high frequency components. The Examiner has made no showing on how to modify Kinoshita to include the additional multiplexers and narrow band- pass filter of Kikuchi or why one of ordinary skill in the art would have been motivated to make such a modification. The

mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. Neither reference, alone or in combination discloses an optical combination structure that combines a set of N/P wavelengths into a single combined optical signal while maintaining a linear orthogonal polarization state for pairs of said wavelengths and while adding optical noise incoherently to minimize optical noise (emphasis added).

Further, while the Examiner also asserts that combining the features of Kinoshita and Kikuchi with Hirt would achieve an apparatus that would add noise incoherently, there is no suggestion or motivation, in any of the references or in the knowledge generally available to one of ordinary skill in the art, to modify the apparatus described in the Kinoshita and Kikuchi references or to combine reference teachings in the manner suggested by the Examiner. It is well established that a statement that modifications of the prior art to meet the claimed invention would have been " 'well within the ordinary skill of the art at the time the claimed invention was made' " because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a prima facie case of obviousness without some objective reason to combine the teachings of the references. See *In re Kotzab*, 217 F.3d 1365, 1371, 55 USPQ2d 1313, 1318 (Fed. Cir. 2000)

Accordingly, Applicants believe all the pending claims are patentably distinct, are in condition for allowance, and should be passed to issue. If the Examiner feels that a telephone conference would in any way expedite the prosecution of the application, please do not hesitate to call the undersigned at (408) 868-4088.

Respectfully submitted,

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